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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,697	03/09/2006	Enrique V. Barrera	11321-P061WOUS	1893

7590 09/23/2008  
Winstead Sechrest & Minick  
PO Box 50784  
Dallas, TX 75201

EXAMINER
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VANORE, DAVID A

ART UNIT	PAPER NUMBER
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2881

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/542,697	<b>Applicant(s)</b> BARRERA ET AL.	
	<b>Examiner</b> David A. Vanore	<b>Art Unit</b> 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-25 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,8,9 and 11-17 is/are rejected.
- 7) ☒ Claim(s) 3,7 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/19/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/15/07</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 4-6, 9, 11-12, 14, and 16-17 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Kawakatsu (USPN 7,220,962).

3. Regarding claims 1 and 11, Kawakatsu teaches a sensing element comprising a plurality of nanotubes attached to an array of cantilevers having carbon nanotube sensing tips (Col. 2 Lines 4-13)), and an electrical probe in contact with the probes (Item 414) which detects light impinging on a cantilever to determine a degree of deformation of an individual cantilever.

4. Regarding claim 2, Kawakatsu teaches a signal and network analyzer (Items 300 and 600) for evaluating the characteristic signal produced and correlating the measurements to mechanical sample conditions (Col. 12 Lines 39-67). Kawakatsu does not explicitly describe a database element, but the signal processing means and network analyzer appear to achieve the same result and would be describable as computers which necessarily have a memory storing means or database.

Art Unit: 2881

5. Regarding claim 4, the claim describes the function of the probe and does not describe further structure. The claim therefore does not further limit the device of claim 1 and is rejected on the same grounds as claim 1.

6. Regarding claim 5, the claim modifies the intended use recited in the preamble of the claim. The claim does not set forth a further structure of the apparatus of claim 1 and therefore fails to further limit claim 1. Claim 5 is rejected on the same grounds as claim 1.

7. Regarding claim 6, Kawakatsu describes cantilevers with tips consisting of carbon nanotubes and does not differentiate between a single or multi-wall nanotube. Therefore, either of these appears acceptable for use in Kawakatsu and Kawakatsu thereby demonstrates the use of one or both of single or multi-walled carbon nanotubes.

8. Regarding claims 9, 16, and 17, the nanotubes arranged on the cantilever array define a three dimensional array, which encompasses a two dimensional array. Note Fig. 20 for example.

9. Regarding claims 12 and 14, the device is attached to or incorporated in an article of manufacture. Note Fig. 20 for example.

***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 2881

12. Claim 8 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: The structure of the modified carbon nanotube set forth in such a manner that it is clear what is being modified.

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 13 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not describe the implementation of the attachment or incorporation of the device with the combination of certain element of the groups recited in claim 13 and 15. For example, the specification does not include description of the combination of a spacecraft and a dam.

***Allowable Subject Matter***

15. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or suggest the apparatus of claim 1, where the

Art Unit: 2881

electrical probe coupled to the carbon nanotube sensing element is a four-point electrical probe.

17. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or suggest the apparatus of claim 1 where the carbon nanotubes have been refined for a desired level of homogeneity selected from uniform diameter, uniform length, uniform chirality, or a combination of these elements.

19. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or suggest the apparatus of claim 1 where the carbon nanotubes have been incorporated further into a matrix material.

21. Claims 18-25 are allowed.

22. The following is an examiner's statement of reasons for allowance:

23. The main reason for the allowance of claim 18 and its dependent claims 19-25 is that the method claim requires the attachment of plural carbon nanotubes to a single electrical probe in the attaching step on page 4 of the claims and the measurement of a change in an electrical property of the carbon nanotubes with the electrical probe.

These limitations are read with all the other limitations of the claim, but they distinguish

Art Unit: 2881

because the prior art appears to attach a single probe to a cantilever for measurement purposes. USPN 7,115,864 teaches the attachment of plural nanotubes to a probe tip, but does not teach the determination of a change in the electrical property of the nanotubes. Note Col. 24 Lines 18-37 of the '864 reference.

24. For these reasons, it appears that these limitations pointed out above distinguish over the prior art when taken with all other limitations of the claim.

25. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Vanore whose telephone number is (571) 272-2483. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2881

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David A Vanore/  
Primary Examiner, Art Unit 2881

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